# Quiet Supersonic Platform Systems Studies and Technology Integration Solicitation RA00-48

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# 1.0 PROGRAM DESCRIPTION

## 1.1 Vision

As the world moves forward into the information age, an emerging trend is the compression of time through the rapid exchange of information. Many terabytes of information are transferred across continents at the speed of light, enabling decisions to be made rapidly on a global scale. However the efficient time-critical transport of people and material generally remains in the subsonic regime.

From the origin of supersonic flight in 1947, the efficiencies associated with long range supersonic cruise flight have eluded aircraft designers all over the world. Historically, the B-58, SR-71, B-70, TU-144, and the Concorde represent the best efforts of the world's pre-eminent aircraft designers. Subsequent false starts have failed to establish the technology base and design methodology for a viable supersonic design. Propulsion systems developments have not addressed supersonic cruise applications for the last several decades. The laws of nature and the physics of flight require system efficiencies that must always be higher in order to achieve increased range and improved performance at a reasonable cost. By necessity, we need an infusion of new and innovative technologies before the vision of efficient and capable supersonic cruise aircraft can be realized.

Supersonic air transport is legally and technologically constrained because a sonic boom is created when a vehicle exceeds the speed of sound. The pressure waves generated in supersonic flight propagate nonlinearly through the atmosphere, coalescing into a sonic boom as it approaches the ground. The resulting sharp pressure rise can rattle buildings and their contents and produce a startle response in individuals. Thus current Federal Aviation Regulations do not allow supersonic flight over land, except by waiver. The vision of the DARPA Quiet Supersonic Platform (QSP) Program is to foster the development of new technologies sufficient to mitigate sonic boom to the point that unrestricted supersonic flight over land is possible.

The QSP program is designed to motivate approaches to sonic boom reduction that bypass incremental "business as usual" approach. The rapid growth in the telecommunications industry is directly related to the speed at which innovation has been transferred from the laboratory to full-scale applications. In a like manner, the QSP program seeks to infuse new technology into supersonic transport applications through an innovative approach to program structure.

In order to capture and to exploit diverse and evolving technologies to the greatest extent possible, DARPA is soliciting a variety of sources including universities and small businesses under the QSP Technology Development Research Announcement. Innovative propulsion concepts are addressed in the Advanced Propulsion Systems Research Announcement. The results of these companion efforts will be evaluated using conceptual aircraft designs by system integrators. Systems studies will be used to establish the relative merits of the new technologies, and the integrators will be tasked with developing an integrated vehicle concept that meets the sonic boom mitigation requirement. A set of goals has been established to "set the bar high" for overall system performance to further motivate the introduction of innovative technology.

## 1.2 Motivation

Unrestricted supersonic flight will enable aircraft with lower overall system costs for both military missions and civil applications. A supersonic strike vehicle can perform more missions per day, get more weapons on target per unit time, and provide a more rapid long-range response capability. Efficient supersonic flight also makes missions such as high-speed deep penetration reconnaissance and the rapid delivery of high value cargo affordable. In the civil aviation sector, a supersonic business jet will enable similar savings of time and money for the transport of people and high-value cargo. Sonic boom mitigation will enable land overflight, which translates into both time and cost savings. Prior work suggests that no single technology will provide the "silver bullet" required to solve the sonic boom problem. Therefore, this program is focused on the validation and integration of multiple breakthrough technologies for noise reduction that can ultimately be integrated into an efficient quiet supersonic vehicle. DARPA is particularly interested in those breakthrough technologies that reduce sonic boom to an acceptable level and which have the concomitant potential to dramatically improve the long range, sustained cruise performance of supersonic aircraft.

Technologies may include, but are not limited to, the following: Concepts considered to be particularly important address direct mitigation of sonic boom by airframe shaping, heat addition, particulate injection, plasmas, temporal and spatial variation of lift distribution, and adaptive flow control. Indirect reduction of sonic boom amplitude by decreasing vehicle gross weight has a known direct impact on sonic boom intensity. Specific approaches to the gross weight reduction include increasing vehicle lift to drag ratio through supersonic laminar flow, advanced materials including foamed metallic structures and high temperature aluminum alloys, and the application of advanced materials and fabrication techniques for lightweight, integrally stiffened structures. Other approaches include new control avionics concepts, high bypass supersonic engines, inlet systems for buried high by-pass engines, advanced high lift concepts, and global optimization over many technologies and aircraft subsystems.

## 1.3 Program Plan and Companion Research Announcements

The overall plan and timeline for the QSP program is illustrated in Figure 1.1. The program is subdivided into three separate solicitations called Research Announcements (RA), with system and technology roles.

RA 00-47: Quiet Supersonic Platform Technology Development targets innovative low boom technologies and is intended to involve non-traditional aircraft technology development players, such as university researchers and small businesses. High risk, high payoff technology will be developed and matured under these efforts. These participants will be asked to work with system integrators funded under RA 00-48 to determine the realizability of their concepts in an integrated vehicle.

RA 00-48: Quiet Supersonic Platform Systems Studies and Technology Integration solicits airframe system integrators to perform systems studies to evaluate the installed effectiveness of technologies developed under the companion solicitations, as well as technologies developed internally. The integrators will be evaluated based on their commitment to innovation, and the

degree to which they are committed to bringing in new technology to address the program requirements and goals.

RA 00-49: Advanced Propulsion Systems will be directed to propulsion system integrators to perform cycle definitions and systems studies for advanced technology integration into engines that enable efficient supersonic flight. The engine companies are being asked to look beyond current engine concepts and to consider propulsion systems that will revolutionize supersonic flight. (Note: The efforts awarded under RA 00-49 will be funded with other than QSP program funds.)

The program is focused on the validation of multiple new and innovative "breakthrough" technologies for noise reduction that can ultimately be integrated into an efficient quiet supersonic vehicle. The airframe system integrators will provide the integration and trade studies to evaluate combinations of supporting technologies, their relative merits, and their realizability. To this end, DARPA will facilitate a formal exchange of QSP technology performance and developmental progress between the system integrators and the technology developers through formal QSP Principal Investigator (PI) Technology Exchange Meetings (TEM). DARPA and the system integrators will negotiate the appropriate selection of noise mitigating technologies to advance to the next stage of development on the basis of government review and the evaluation of QSP technology mix by the systems integrators through systems trade studies.

## 1.4 QSP Program Requirement

Given the objective of validating an approach to sonic boom mitigation, the single QSP requirement is the reduction of sonic boom ground signature initial shock strengths to an amplitude no greater than 0.3 pounds per square foot.

## 1.5 QSP Program Performance Goals

Mitigation of sonic boom overpressure and long-range supersonic flight requires major performance improvements that are a departure from current technology trend lines. New and innovative technologies need to be integrated into revolutionary system concepts. The following performance objectives are established to drive the insertion of new technology into innovative system concepts for a 100,000 pound class vehicle:

- Cruise Mach number 2.4
- Lift-to-Drag (L/D) 11
- Payload mass fraction 20%
- Thrust Specific Fuel Consumption (TSFC) 1.05 lb/lb-hr
- Engine Thrust/Weight ratio 7.5
- Range 6,000 nmi

Conceptual QSP aircraft should be within regulations of landing and take-off noise performance that complies with the civil aircraft noise standards (Federal Aviation Regulation 36 Stage 3 requirements).

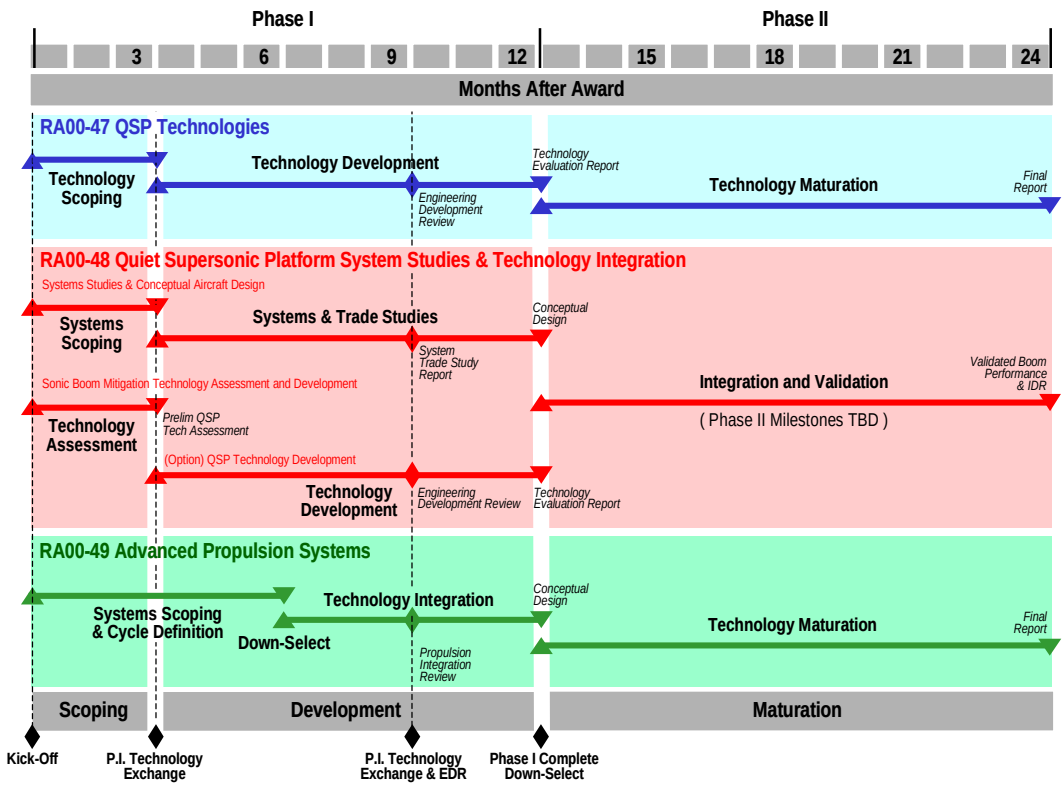


Figure 1.1 QSP Overall Program Schedule and Milestones

These QSP program performance goals are very aggressive. However, the systems integrators are offered some latitude to adjust these goals provided they are consistent with the stated goals in the aggregate. For example, if there are technologies, which can lead to L/D greater than the stated goal, this can be traded against the goal for TSFC.

# 2.0 SYSTEMS STUDIES AND TECHNOLOGY INTEGRATION

## 2.1 Objectives

The objectives of this effort are to 1) evaluate boom mitigation technologies in the context of a conceptual vehicle design; 2) determine what mix of technologies satisfies QSP requirements and goals; and, 3) develop and validate key boom mitigation technologies to support an integrated system.

The major objective of the DARPA QSP program is to develop the technologies that enable low boom efficient supersonic flight. DARPA will therefore be mission neutral and not advocate any particular mission concept. Vehicle concepts must be consistent with the validation of an integrated mix of technologies.

The integrators shall evaluate technologies developed under the companion RA 00-47 and RA 00-49 (see section 1.3 above) in the context of a conceptual aircraft design. Based on this evaluation, the offerors may choose to augment these technologies with those developed and matured internally under RA 00-48. The offeror shall validate this mix of key technologies through appropriate testing and computation. The offeror shall consider the appropriate technology mix required for a conceptual low boom vehicle at the end of Phase I, and at the end of Phase II shall have a fully validated low-boom integrated design. Finally, the offeror shall present a technology development path to verify low boom performance through appropriate demonstrations.

## 2.2 Schedule

The effort under this solicitation will be divided into two phases with multiple awards for the duration of the first 12-month phase. The first phase is described with further detail in the next section. Upon completion of the first phase and after consultation with a government review team, DARPA may perform a down select for the second phase of this solicitation for an additional 12 months.

## 2.3 Management Approach

DARPA is responsible for the overall program management. As the Department of Defense lead agency for advanced technology, DARPA is focused on high risk / high payoff programs. DARPA will use a diverse government team to evaluate proposals and conduct milestone reviews. This team in turn will provide DARPA feedback for program decision-making. The government team will consist of representatives from DARPA as well as organizations such as NASA, Air Force Aeronautical Systems Center, Air Force Research Laboratory, and Naval Air Systems Command.

Program participants shall implement a streamlined approach to program management which includes team member cooperation, small staffs, abbreviated oversight, face-to-face communications, real-time decision making and problem solving, and short, direct lines of authority. Program participants should be prepared for the formal exchange of technical

information with other participants in the companion research announcements, subject to signed non-disclosure agreements.

## 2.4 Other Transactions

DARPA intends to award this effort as an Other Transactions for Prototype (OT for Prototype) under Section 845, National Defense Authorization Act for Fiscal Year 1994, as amended. As part of the OT for Prototype agreement, the Government will maintain government purpose rights and share all funded development data between all program participants when the Government has provided the majority of the funding. If participants want to retain greater rights in QSP technology, this agreement will require an a priori, clearly identified cost sharing applied to each government funded QSP program phase. Additionally, QSP program participants will demonstrate robust methods to assure cost control and quality of work. Given the speed in which the development is to advance, participants must implement streamlined processes for team building and subcontracting.

## 2.5 Funding

Total funding for the Phase I of this solicitation is $7.5M. The first phase is anticipated to be awarded to at least three participants, with nominal awards of $2.5M including any options. Phase II funding for this solicitation is anticipated to be at least $10M. Offerors should plan for Phase II efforts of the order of $5M per award.

# 3.0 PHASE I OBJECTIVES

This section describes the objectives to be addressed in Phase I. A chart describing the breakdown of activities is shown in Figure 3.1.

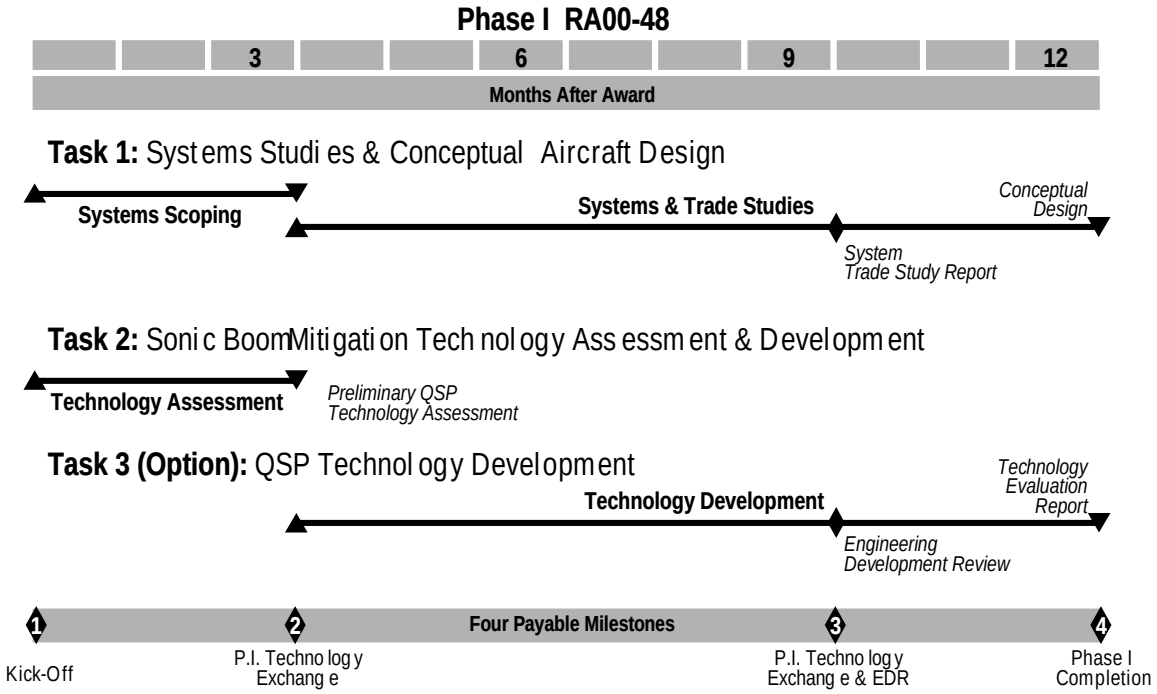


Figure 3.1 Phase I of Systems Studies and Technologies for QSP Activities

## 3.1 Phase I Overview

Phase I is subdivided into two major tasks and an optional third task. Task 1 is Systems Studies and Conceptual Aircraft Design. Task 2 is Sonic Boom Mitigation Technology Assessment and Task 3 (optional) is Sonic Boom Mitigation Technology Development.

### 3.1.1 Task 1 Systems Studies and Conceptual Aircraft Design

#### 3.1.1.1 Subtask 1.1 - Systems Scope

The offeror shall develop a high-level plan for developing a vehicle capable of sustained supersonic cruise that is consistent with the QSP goals. The QSP program is focused on sonic boom mitigation, this constitutes only a small fraction of what it would take to develop a vehicle capable of long-range supersonic cruise capability. The scoping process shall address an overall plan from the perspective of the system integrator, with the required duration, level of effort and cost required to achieve supersonic flight consistent with the QSP goals. The offeror shall also show how the two-year QSP program contributes to the broader objective of designing a fully integrated long-range supersonic vehicle.

#### 3.1.1.2 Subtask 1.2 - Systems and Trade Studies

The second activity of this task is to conduct systems and trade studies required to assess the integration of QSP technologies for conceptual aircraft consistent with the program goals. DARPA will be mission neutral and not support any mission concept over another for systems and trade studies. The offeror is free to decide high payoff missions appropriate to QSP technology. The offeror shall identify key technologies necessary to support their chosen concept or concepts, including examination and analysis of all technologies under development in the companion research efforts (RA 00-47 and RA 00-49), as well as in-house technology development supported under Task 2.

#### 3.1.1.3 Subtask 1.3 - Conceptual Design

The third activity of this task is the development of a conceptual aircraft design. The offeror shall create an integrated vehicle concept that satisfies sonic boom mitigation requirements and is consistent with QSP performance goals. The major deliverable associated with this task is a package, which includes a scale desktop model prototype of the QSP vehicle, documentation of the vehicle conceptual design, and a review of the supporting design analysis. For the purposes of this RA, an aircraft conceptual design is defined to have at least external layout, weight, weight breakdown, aerodynamic performance, installed propulsion system performance, subsystem performance, and top-level system performance with design detail sufficient for evaluation of low boom technology approaches, including estimates of low boom performance.

### 3.1.2 Task 2 Sonic Boom Technology Assessment

The offeror shall perform an assessment of sonic boom mitigation technologies. This is to include technologies funded under the companion RA 00-47 as well as any additional technologies that the offeror considers germane to the problem. The offeror shall provide a means to rate the various technologies in terms of a set of objective criteria. These criteria shall consider the technology effectiveness, realizability in a real system, and maturity, as well as any additional factors considered relevant.

### 3.1.3 Task 3 (Option) QSP Technology Development

Approximately 2 months after award, the offeror shall identify those critical technologies and design tools not under development through RA 00-47 as candidates for in-house technology development. At that time, DARPA will provide evaluation criteria for this option and request the offeror to submit a proposal for the option. If it is selected for funding, the option will be exercised and development of the candidate technologies will commence. Intellectual property rights shall be negotiated at this point based on offeror cost sharing.

## 3.2 Phase I Milestones

As part of the negotiated OT for Prototype agreement, DARPA envisions four payable milestones. Figure 3.1 illustrates Phase I milestones in relation to the tasks. At a minimum, the offeror must satisfy the following exit criteria to receive the milestone payment. The payable

milestones for the Phase I work occur at kickoff and at 3 months, 9 months, and 12 months after award, respectively.

### 3.2.1 Milestone 1

The exit criterion for the first payable milestone is agreement kick-off meeting.

### 3.2.2 Milestone 2

The exit criterion for Milestone 2 is a Milestone Report with the following information:

(1) Systems Scope: Offeror's perspective as to what constitutes a demonstration of sustained supersonic cruise that is consistent with the QSP goals in terms of time, level of effort, and risk;
(2) QSP Scope: How far along this path the offeror will progress given two years and $7.5M of projected funding ($2.5M Phase I and $5M Phase II);
(3) Preliminary Assessment of QSP Technologies: assess the relative merit of available technologies, identify missing required technology, and present a first cut review of all QSP technology development, including performance payoff, risk, integration potential, realizability, and system cost impact including objective criteria used to review these technologies; and,
(4) QSP Technology Development Plan (optional): outline the plan for the offeror's in-house QSP technology development. The plan shall include both Phase I and II activities, including Phase II milestones and exit criteria.

### 3.2.3 Milestone 3

The exit criteria for Milestone 3 of Phase I include the following:

(1) QSP Systems Trade Study Report: A quantitative assessment of program-wide technologies as integrated into the aircraft system concept, including performance payoff, risk, integration potential, realizability, and system cost impacts;
(2) QSP Engineering Development Review (EDR): A viewgraph presentation to report status of QSP technology development, including progress toward process and performance goals and progress towards technology demonstration. The EDR will form one part of the basis for funding QSP technology development into Phase II.

### 3.2.4 Milestone 4

The exit criteria for Milestone 4 of Phase I include the following:

(1) QSP Conceptual Aircraft Design: This design shall be consistent with QSP goals and include, but is not limited to, external layout, weight, weight breakdown, aerodynamic and flight performance, and top-level system performance including estimates of boom performance and a review of the supporting design analysis. The conceptual design includes a  scale desktop model of the QSP prototype vehicle;
(2) QSP Technology Development Report: A written summary report of QSP technology development conducted during Phase I. This should include all technologies under development that are relevant to the conceptual design.

Additional exit criteria of each defined milestone above shall be defined in the offeror's proposal along with appropriate milestone award amount. At the milestone review, emphasis shall be placed on communication of information and discussion of issues, not on generation of required paperwork. Milestone review (1) is the kickoff meeting that will be held at the offeror's site when an agreement has been negotiated, and will be followed by an overall program kickoff meeting when all agreements have been negotiated. Milestone reviews (2) and (3) will occur at or in conjunction with the QSP Principal Investigator's (PI) Technical Exchange Meetings. Milestone review (4) will occur at the offeror's site.

### 3.3 Participation in PI Meetings

A series of technical interchange meetings will be held to facilitate the exchange of information between the technology developers (RA 00-47), the integrators of advanced propulsion systems (RA 00-49), and the systems integrators. All will attend an overall Kick-off meeting as well as two Principal Investigator Technical Exchange Meetings, to be scheduled at about the third month and the ninth month of Phase I. These meetings will be closed to all parties not involved in the QSP program.

DARPA intends to build a common technology base that will be evaluated and leveraged by the system integrators. The systems integrators are required to attend with their technical staff to review technologies for inclusion into their systems and trade studies. The evaluation and systems benefit of QSP technologies will influence the support of DARPA program management and further direction of the program.

### 3.4 Phase II Transition Criteria

Phase II is envisioned to consist of an Integration and Validation Task. Selected conceptual designs will be evolved to a system-integrated design. The system-integrated design is defined to be a design with internal and external system layouts for all flight critical systems with a level of detail and sufficient analyses to support realizability of the system while meeting QSP goals and objectives. Non-flight critical and mission systems are defined to a minimum system interface definition. Noise reduction technologies will be validated based on analysis, wind tunnel testing, and/or flight-testing. The technologies will in turn be integrated into a vehicle design in an integrated fashion. The end state of Phase II is a validated low boom supersonic aircraft design.

After submission of Milestone 3, the offerors will be asked to submit cost and technical proposals for Phase II of this effort. Scope of the effort as well as evaluation criteria will be provided at that time.

### 3.5 Intellectual Property Rights

At a minimum the government will retain Government Purpose Rights for all government-funded development under the QSP program. To the extent an offeror proposes substantial cost share, the Government will consider waiving or reducing additional patent and data rights.

Offerors will also have access to intellectual property developed under RA 00-47 and RA 00-49, subject to appropriate protective measures to be determined by the parties.

# 4.0 PROPOSAL PREPARATION INSTRUCTIONS

This section contains the procedures and general Agreement instructions for the offeror. The offeror shall use the following outline in response to this solicitation.

1) Executive Summary
2) Technical Approach and Substantiation
3) Management Approach
4) Qualifications to Perform Program
5) Proposed Agreement with Attachments
    a) Attachment 1: Task Description Document (TDD)
    b) Attachment 2: Integrated Master Plan (IMP)
        Product IMP
        Process IMP
6) Integrated Master Schedule (IMS)
7) Cost Proposal
8) Section 845 “Other Transactions for Prototypes” Questionnaire Response.

## 4.1 Executive Summary

This document is meant to be an executive level description of key elements and unique features of each offeror’s proposed QSP Systems Studies and Technology Integration Phase I program. The Executive Summary shall address the offeror's Program Objectives and Approach. Additionally, the summary should discuss the Technical and Management Approach, including the approach to sonic boom mitigation technology identification, evaluation, development and integration, design approach, unique systems solutions, and ability to integrate new technologies. If a teaming arrangement is proposed, team composition should also be included. Also, an approach to data rights should be proposed. Finally, the executive summary should include the top-level Program schedule and proposed cost.

## 4.2 Technical Approach and Substantiation

This section of the proposal provides offerors the opportunity to explain and substantiate the significant technical features of their program for the program tasks: systems scoping, systems study, conceptual design, QSP technology assessment, development, validation, and integration. The offeror should include its vision of the key technologies to enable low boom supersonic flight. Additionally, the offeror should provide significant details to address all the relevant evaluation criteria outlined in Section 5.0.

## 4.3 Management Approach

In this section, offerors are to describe their overall management approach to the effort including any measures that will be taken to break from a “business as usual” mentality, streamline program management, and institute innovative new management practices. Relationships between the offeror and either its subcontractors or team members are to be described.

### 4.4 Qualifications to Perform Program

In this section, offerors are to describe their qualifications to successfully complete both Phase I and Phase II of the Systems Studies and Technology Integration. In describing their qualifications, offerors should be particularly attentive to identify past experience as well as expertise of the team members designated in the proposal as managers, technology developers and researchers, systems analysts, engineers, designers, and other key disciplines. The offeror shall provide a description of the facilities and equipment required to perform the technology development and validation. The offeror shall provide detailed past performance information as specified in the evaluation criteria.

### 4.5 Proposed Agreement

The offerors are required to include proposed terms and conditions for the ultimate agreements with DARPA. A Model Agreement is provided as a guide in Section 6.0. The offerors are free to propose changes, additions or deletions to the Model Agreement. Changes and modifications will be up for discussion during Agreement negotiations. Any proposed changes shall be documented in a separate agreement addendum with rationale supporting the proposed change. Rationale located in other areas of the solicitation response may be cross-referenced. It is the Government's intent to negotiate terms and conditions of the final agreements with prospective offerors prior to making award selections

#### 4.5.1 Scope of Agreement – Article I to the Model Agreement

Article I in the Model Agreement is to be written by the offeror. The purpose of this article is to briefly summarize the offerors' response to this solicitation in terms of their overall vision for accomplishing the goals of this solicitation, and for completing QSP objectives. A discussion of the offeror's intended interaction among team members, technology participants funded under RA 00-47, propulsion system developers funded under RA 00-49, and the Government panel should be provided. Also, include a discussion of the business arrangement or type of agreement the parties are entering into.

#### 4.5.2 Task Description Document (TDD)

The offeror shall prepare a TDD in offeror's format that describes the work effort necessary to meet the milestones and Statement of Objectives for Phase I of this solicitation. The TDD will include the offeror's plans to ensure technology development is on the path to validate low boom supersonic flight capability. In particular, the offeror will need to include in its plan processes to ensure unbiased assessment of technology developed under this RA as well as all technology developed under the companion announcements (RA 00-47 and RA 00-49) in the context of integration into aircraft systems. The TDD shall be incorporated into the offeror's proposed Agreement.

In addition, the offeror will need to breakout the level of detail with a notional Work Outline. The notional Work Outline describes the program structure outline as viewed by DARPA. It provides a common numbering system that ties the program elements together. The offeror is

free to use their own Work Outline. This numbering system or the one proposed by the offeror must be consistent throughout all program documentation. To allow for equitable comparison of alternative competitor outlines, the offeror shall include all program elements shown below at level three.

| Outline Code | Level 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 0000 | QSP Systems Studies and Technology Integration | | | |
| 1000 | | Systems Development | | |
| | | | Systems Scope | |
| | | | QSP Scope | |
| 2000 | | Systems Trade Study | | |
| | | | Systems Trades Study Report | |
| | | | Conceptual Design | |
| 3000 | | Sonic Boom Mitigation Technology Assessment | | |
| | | | Preliminary Assessment of QSP Technologies | |
| | | | QSP Technology Development Plan | |
| 4000 | | QSP Technology Development | | |
| | | | QSP Technology Engineering Development Review (EDR) | |
| | | | QSP Technology Development Report | |

### 4.5.3 Integrated Master Plan (IMP)

The offeror shall develop a comprehensive, notional IMP, in contractor format, that describes Phase I of the Systems Study and Technology Integration. The IMP is divided into the Product IMP and the Process IMP. Both the Product IMP and Process IMP for Phase I shall be provided to the Government as an attachment to the offeror's proposed Agreement.

#### 4.5.3.1 Product Integrated Master Plan (IMP)

The Product IMP shall address specification, verification, and significant management accomplishments necessary to complete the activities for Phase I. The Product IMP should contain accomplishments and exit criteria sections tied to the program milestones (Section 3.2). Each task shall be accompanied by specific criteria that will be used to judge the completion of tasks and milestones. It is recognized that the technology developed in the Sonic Boom Mitigation Development and Validation task may not be fully defined until the completion of the Preliminary Assessment of QSP Technologies. Characteristics of the key elements of the IMP should be based on a WBS and relate to significant accomplishments (discrete steps in progress) and program events (conclusion or initiation of an interval of major program activity).

#### 4.5.3.2 Process Integrated Master Plan (IMP)

The Process IMP is a collection of concise summaries providing the Government visibility into the offeror's key functional processes and procedures, how the processes and procedures relate to

the integrated product development process, and an overview of the effort required to implement them. The Process IMP should address only the key elements of implementing or developing a process or procedure (i.e., what it will be and how it will be implemented), since it will already be included in the Agreement. The format for defining the key processes should be limited to:

- Statement of Objective - This should include a brief description of the overall program goals and how the objectives of the offeror's processes relate to those goals.
- References - For applicable processes, the offeror may reference existing internal procedures and systems. A brief description of each reference should be provided if that reference is not readily available to the Government.
- Approach - This sub-section of the Process IMP describes what the offeror will do; how the offeror will interface with DARPA; and, how the offeror will meet the objectives of the program through application of defined processes.

### 4.6 Integrated Master Schedule (IMS)

An initial IMS shall be delivered with the Phase I proposal. The IMS shall outline the detailed tasks and the amount of time expressed in calendar schedules necessary to achieve the milestones and significant functional accomplishments in Phase I. It shall be a tiered scheduling system corresponding to the Work Outline or dependent products, tasks and subtasks. The first iteration of the IMS should be the resolution of the offeror's TDD or one layer up, as determined by the offeror. The characteristics of the key elements of the IMS include; (1) Detailed Tasks, which are defined as the detailed work effort to be completed in support of a specific significant milestone or functional accomplishment, and (2) Calendar Schedule, which give the detailed schedule and dates of the period of performance for each work effort. The IMS will not be included in the Agreement.

### 4.7 Section 845 "Other Transaction for Prototype" Questionnaire Response

Responses to questions stated in Appendix A should detail how the use of a Section 845 "Other Transaction for Prototypes" agreement for the QSP Systems Studies and Technology Integration phase, if awarded to your team, will contribute to a broadening of the technology and industrial base available for meeting Department of Defense needs. In addition, the responses should show how the use of a Section 845 "Other Transaction for Prototypes" agreement will foster new relationships and practices that support the national security of the United States. Your response will, in part, form the foundation of a DARPA report to DoD and Congress. Responses are to be provided in the offeror's format.

### 4.8 Cost Proposal

The cost proposal is to be provided in the offeror's format. However the cost proposal shall have a Cost Summary Sheet as the lead page to the Cost Proposal section. This page shall be a one-page summary of program costs in tabular format for Phase I excluding Task 3 (nominally one year in duration); prime offeror / team lead, subtier participants / team members, and funding to government laboratories and agencies; cost of major facility utilization (such as wind tunnels) and industry cost sharing if any.

Certified cost or pricing data is not required. However, in order for the Government to determine the reasonableness, realism and completeness of your cost proposal, the following data must be provided for each team member and in a cumulative summary:

Labor: Total labor includes direct labor and all indirect expenses associated with labor, to be used in the Systems Studies and Technology Integration for the Phase I period of performance. Provide a breakdown of labor hours and rates for each category of personnel to be used on this project.
Direct Materials: Total direct material that will be acquired and/or consumed in Phase I. Limit this information to only major items of material (>$1,000) and how the estimated expense was derived. Include major facility requirements such as wind tunnel testing or flight research vehicles. These requirements may address specific facilities, but should also provide details of facility capability requirements and estimates of total facility occupancy and test time. At its discretion, DARPA may choose to make bulk purchases of facility time in one or more major test facilities and apportion that test time to program participants.
Subcontracts: Describe major efforts to be subcontracted, the source, estimated cost and the basis for this estimate. A summary cost breakdown should be provided for each subcontract proposed.
Travel: Total proposed travel expenditures relating to Phase I. Limit this information to the number of trips, and purpose of each cost.
Equipment: Any equipment to be acquired for the effort. Breakdown the equipment into those items required for Phase I.
Other Costs: Any direct costs not included above. List the item, the estimated cost, and basis for the estimate.

The cost proposal should tell the story of how and why you are planning to complete your proposed TDD. Activities such as demonstrations required to reduce the various technical risks should be identified in the TDD and reflected in the cost proposal.

The offeror should provide a total estimated price for the major IR&D and cost sharing activities associated with the program. The offeror should state whether each IR&D program is dedicated or if it is being pursued to benefit other programs as well. The cost sharing estimate should include the type of cost share, i.e. cash.

If a teaming arrangement is proposed the above cost information shall be provided for all team members.

### 4.9 Proposal Procedures

Proposals that do not satisfy the following form and format requirements will be rejected without review and returned to the offeror.

#### 4.9.1 Organization

The offeror's Proposal should be submitted as a single volume in a standard three-ring, loose leaf binder with individual pages unbound and printed single sided. The entire proposal, excluding

section dividers, should not exceed 90 pages. The evaluation team will not consider pages submitted in excess of the page limit. One original and 7 copies are required. The page limitations for each section are as follows:

Proposal Format and Page Limitations

| SECTIONS | Pages |
|---|---|
| Executive Summary | 4 |
| Technical Approach and Substantiation | No Limit |
| Management Approach | No Limit |
| Qualifications to Perform Program | No Limit |
| Proposed Agreement with Attachments | No Limit |
| Integrated Master Schedule | 5 |
| Cost Proposal | 10 |
| Section 845 Questionnaire | 2 |
| Total | 90 Pages |

### 4.9.2 Page and Print Information

Each page should be on an 8-1/2" x 11" sheet with a font size of not less than 12 points; however, figures, charts, labels, headers and footers may be submitted with a font size of not less than 8 points. Margins should be at least 1 inch on all sides. Fold out pages will be counted as multiple pages. We do not anticipate classified proposals. Any restrictions must be placed with a legend within the proposal on each affected sheet/page.

### 4.9.3 Proposal Delivery Information

Authorized representatives of the offeror must sign proposal volumes. The deadline for receipt of proposals is 2 October 2000, 2:00 PM Eastern Time. The delivery address for mailed or hand-carried responses is:

Defense Advanced Research Projects Agency
Attention: RA 00-48
3701 N. Fairfax Drive
Arlington, VA 22203-1714

Responses not received at the address and time specified above will be considered as a late proposal and will not be reviewed.

### 4.9.4 Electronic Information

Offerors are also required to submit their proposal in electronic format, on Iomega 100 MB Zip disks, Windows or Macintosh format, preferably Microsoft Office 97 compatible.

### 4.9.5 Submission of Classified Information

Offerors intending to include classified information or data as part of their submissions shall, in advance of providing their proposals to DARPA, contact the POC for this RA (Mr. Rick Hohman, DARPA/SID, (703) 696-2385, rhohman@darpa.mil) for guidance.

### 4.9.6 Solicitation Questions and Answers

Communication between industry and the Government is highly encouraged throughout this effort. Contractors may contact the Government focal points listed in the solicitation for any questions or clarifications up until the time that proposals are received. Questions will be reviewed and answered on a Frequently Asked Questions (FAQ) link from the DARPA Solicitations web page for this particular RA. Once proposals have been received, the Government Evaluation Team may contact the offeror with questions or clarification requests about the proposal. During the evaluation period, offerors should initiate all inquiries through the Agreements Officer.

### 4.9.7 Non-Government Experts

The Government intends to use support contractors, plus other independent experts to assist in processing and administering proposals during the Source Selection, and to provide advice relative to selected technical areas. These personnel are restricted by their contract from disclosing information contained in any proposal for any purpose to anyone outside of the Source Selection for this effort. Moreover, all personnel used in this capacity are required to enter into separate Organizational Conflict of Interest/Non Disclosure Agreements to this effect. By submission of its proposal, a team agrees that proposals may be disclosed to these personnel for the purpose of providing this assistance.

# 5.0 EVALUATION CRITERIA FOR AWARD

## 5.1 Introduction

Phase I selection will be made based on the selective evaluation of proposals based on the criteria outlined in this section.

## 5.2 Basis for Phase I Award

Successful Phase I proposals will incorporate a balanced approach that responds to all four of the following selection criteria.

### 5.2.1 Qualifications to Perform Program

The objective of this criterion is to establish that the offeror has all of the requisite knowledge, skills and capabilities necessary to perform the proposed program. The offeror must identify what needs to be done; must establish that they know how, and can do it; and, must propose a plan and management approach that will work for the proposed program. The evaluation factors include:

1. Experience in sonic boom and noise reduction technology integration;
2. Experience, ingenuity, and expertise of the proposed team, including identification of key personnel;
3. Experience in the design and development of supersonic aircraft;
4. Overall Management Approach; and,
5. Offerors capabilities and corporate qualifications including the achievements of key personnel including resumes, and the adequacy of facilities and equipment.

### 5.2.2 Technical

The objective of this criterion is to establish that the offeror has: (1) the requisite skills, capabilities, tools, and knowledge base necessary to conceptualize an advanced supersonic cruise aircraft; (2) the ability to incorporate a variety of technologies into a realistic, advanced, practical, and efficient low boom aircraft design concept; (3) the ability to quickly and effectively identify and rank important and necessary technologies early in the conceptual design phase; and (4) the ability to describe the accelerated development process required to incorporate these technologies on a schedule that can support the QSP Program boom mitigation requirement and performance goals. The evaluation factors are:

1. System design approach, including identification of skills and design tools to be utilized;
2. Overall scientific or technical merit including degree of innovation, technical approach, and understanding of the technical and operational issues;
3. Approach to technology identification, evaluation, and integration;
4. Unique systems solutions, including statement of why and how it is superior or preferred and the relationship to the stated goals; and,
5. Unique capabilities of the system integrator and team including identification and experience of key personnel.

### 5.2.3 Innovation

The objective of this criterion is to incentivize offerors to be innovative in their response to the solicitation and in their approach to the program. Innovative proposals and approaches will exhibit a healthy disregard for conventional thinking. The following proposal areas will be evaluated for innovativeness:

1. Overall management approach including innovative relationships between prime contractors and subcontractors, methods to reduce overhead and other cost burdens as well as other cost areas, and inventive new management practices;
2. Teaming arrangements that include the integration of non-traditional commercial companies with minimized exclusivity between team members and companion RA participants;
3. Technology integration that allows synergistic combinations of diverse enabling technologies; and,
4. Agreement terms and conditions.

### 5.2.4 Cost

The objective of this criterion is to assure that cost considerations such as cost realism, reasonableness, and cost benefit of the QSP program goals and objectives are included in the evaluation process.

# 6.0 MODEL AGREEMENT

(THIS MODEL IS MERELY A GUIDE. VARIOUS ARTICLES ARE NEGOTIABLE DEPENDING UPON THE PROPOSED AMOUNT OF COST SHARE AS WELL AS OTHER CONSIDERATIONS.)

**AGREEMENT**

**BETWEEN**

**(INSERT TEAM NAME AND ADDRESS)**

**AND**

**THE DEFENSE ADVANCED RESEARCH PROJECTS AGENCY**
**3701 NORTH FAIRFAX DRIVE**
**ARLINGTON, VA 22203-1714**

**CONCERNING**

**QUIET SUPERSONIC PLATFORM SYSTEMS STUDIES AND TECHNOLOGY DEVELOPMENT**

Agreement No.: MDA972-01-9-XXXX
Procurement Guidance No.:
Total Estimated Government Funding of the Agreement: $
Team's Cost Share/Contribution: $
Funds Obligated: $
Authority: 10 U.S.C. 2371 and Section 845 of the 1994 National Defense Authorization Act for Fiscal Year 1994, as amended.

Line of Appropriation: AA

This Agreement is entered into between the United States of America, hereinafter called the Government, represented by The Defense Advanced Research Projects Agency (DARPA), and the (INSERT NAME of Team) pursuant to and under U.S. Federal law.

| | |
|---|---|
| FOR (INSERT TEAM's NAME) | FOR THE UNITED STATES OF AMERICA<br>THE DEFENSE ADVANCED RESEARCH PROJECTS AGENCY |
| _____ | _____ |
| (Signature) | (Signature) |
| (Name, Title) (Date) | (Name, Title) (Date) |

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**ARTICLES** **PAGE**



**ATTACHMENTS**

## ARTICLE I: SCOPE OF THE AGREEMENT

*This article should state your vision and goals for the System Studies and Technology Development Phase of the DARPA Quiet Supersonic Platform Program and describe how your proposed program satisfies the statement of objectives. This article should summarize the scope of the work and business arrangement you are committing to (as described in detail in Article III, Statement of Objectives) by entering into this Agreement.*

*In addition, this article should discuss the way you will interact with the DARPA program team.*

*If there are dual and/or commercial uses, be sure to include them but discuss the military uses first.*

## ARTICLE II: TERM

A. The Term of this Agreement

This Agreement commences upon the date of the last signature hereon and continues for the duration of the System Studies and Technology Development Phase. For planning purposes, the estimated period of performance for the System Studies and Technology Development phase is date of award through 12 months.

B. Termination Provisions

Subject to a reasonable determination that the program will not produce beneficial results commensurate with the expenditure of resources, the Government may terminate this Agreement by written notice to TEAM, provided that such written notice is preceded by consultation between the Parties. In the event of a termination of the Agreement, it is agreed that disposition of Data developed under this Agreement, shall be in accordance with the provisions set forth in Articles X, Data Rights. The Government and TEAM will negotiate in good faith a reasonable and timely adjustment of all outstanding issues between the Parties as a result of termination. Failure of the Parties to agree to a reasonable adjustment will be resolved pursuant to Article VIII, Disputes. The Government has no obligation to pay for any milestones beyond the last completed and paid milestone.

C. Extending the Term

The Parties may extend by mutual written agreement the term of this Agreement if funding availability and research opportunities reasonably warrant. Any extension shall be formalized through modification of the Agreement by the Agreements Officer and the TEAM Administrator.

## ARTICLE III: MANAGEMENT OF THE PROJECT *(PROVIDE A PLAN FOR THE MANAGEMENT OF THE PROJECT INCLUDING INTERACTION WITH DARPA PERSONNEL.)*

**ARTICLE IV: AGREEMENT ADMINISTRATION**

Administrative and contractual matters under this Agreement shall be referred to the following representatives of the parties:

**DARPA**: Ms. Barbara Meyrowitz, Agreements Officer, Tel: (703) 696-4434

**TEAM**: *(INSERT NAME) (INSERT TITLE) (INSERT TELEPHONE NUMBER)*

Technical matters under this Agreement shall be referred to the following representatives:

**DARPA**: Dr. Richard Wlezien, Agreements Officer's Representative, Tel: (703) 696-2377

**TEAM**: *(INSERT NAME) (INSERT TITLE) (INSERT TELEPHONE NUMBER)*

Each party may change its representatives named in this Article by written notification to the other party.

**ARTICLE V: OBLIGATION AND PAYMENT** *(OTHER OPTIONS WILL BE CONSIDERED)*

**A. Obligation**

1. The Government's liability to make payments to the Team is limited to only those funds obligated under this Agreement or by modification to the Agreement. DARPA may incrementally fund this Agreement.

2. If modification becomes necessary in performance of this Agreement, pursuant to Article IV, paragraph E, the DARPA Agreements Officer and Team Administrator shall execute a revised Schedule of Payable Milestones consistent with the then current Program Plan.

**B. Payments**

1. In addition to any other financial reports provided or required, the Team shall notify the DARPA Agreements Officer immediately if any contribution from a Team Member is not made as required.

2. Prior to the submission of invoices to DARPA by the Team Administrator, the Team shall have and maintain an established accounting system that complies with Generally Accepted Accounting Principles or Cost Accounting Standards (CAS), whichever is applicable, and with the requirements of this Agreement, and shall ensure that appropriate arrangements have been made for receiving, distributing and accounting for Federal funds. The Parties recognize that as a conduit, the Team does not incur nor does it allocate any indirect costs of its own to the Team Member cost directly incurred pursuant to this Agreement. Consistent with this, an acceptable accounting system will be one in which all cash receipts and disbursements are controlled and documented properly.

3. The Team shall document the accomplishments of each Payable Milestone by submitting or otherwise providing the Payable Milestones Report. The Team shall submit an original and one (1) copy of all invoices to the Agreements Officer for payment approval. After written verification of the accomplishment of the Payable Milestone by the Agreements Officer's Representative, and approval by the Agreements Officer, the invoices will be forwarded to the payment office within fifteen (15) calendar days of receipt of the invoices at DARPA. Payment approval for the final Payable Milestone will be

made after reconciliation of DARPA funding with actual Team contributions. Payments will be made by DFAS-IN, Defense Agency Financial Services, Attn: DFAS-IN/AKB (Vendor Pay), 8899 East 56th Street, Indianapolis, IN 46249-1325 within fifteen (15) calendar days of DARPA's transmittal. Subject to change only through written Agreement modification, payment shall be made to the address of the Team Administrator set forth below.

4. Address of Payee: *(INSERT NAME AND ADDRESS OF PAYEE)*

5. Government funds shall be maintained in an interest-bearing account prior to disbursement to Team Members. This account shall not be in U. S. Treasury Notes. Any interest earned shall be remitted annually to the DARPA Agreements Officer, or designee. Interest payments shall be made payable to the U. S. Treasury. Interest amounts less than $250 per year may be retained by the Team for administrative expenses.

6. Payments shall be made in the amounts set forth in Schedule of Payments and Payable Milestones, provided the DARPA Agreements Officer's Representative has verified the accomplishment of the Payable Milestones. It is recognized that the quarterly accounting of current expenditures reported in the "Quarterly Business Status Report" is not necessarily intended or required to match the Payable Milestones until submission of the Final Report; however, payable milestones shall be revised during the course of the program to reflect current and revised projected expenditures.

7. Limitation of Funds: In no case shall the Government's financial liability exceed the amount obligated under this Agreement.

8. Financial Records and Reports: The Team Members shall maintain adequate records to account for all funding under this Agreement and shall maintain adequate records to account for Team Member funding provided under this Agreement. Upon completion or termination of this Agreement, whichever occurs earlier, the Team Administrator shall furnish to the Agreements Officer a copy of the Final Report. The Team Members' relevant financial records are subject to examination or audit on behalf of DARPA by the Government for a period not to exceed three (3) years after expiration of the term of this Agreement. The Agreements Officer or designee shall have direct access to sufficient records and information of the Team Members, to ensure full accountability for all funding under this Agreement. Such audit, examination, or access shall be performed during business hours on business days upon prior written notice and shall be subject to the security requirements of the audited party.

9. To the extent that the total government payments under this agreement exceed $5,000,000, the Comptroller General, at its discretion, shall have access to and the right to examine records of any party to the agreement or any entity that participates in the performance of this agreement that directly pertain to, and involve transactions relating to, the agreement for a period of three (3) years after final payment is made. This requirement shall not apply with respect to any party to this agreement or any entity that participates in the performance of the agreement, or any subordinate element of such party or entity, that has not entered into any other agreement (contract, grant, cooperative agreement, or "other transaction") that provides for audit access by a government entity in the year prior to the date of this agreement. This paragraph only applies to any record that is created or maintained in the ordinary course of business or pursuant to a provision of law. All the terms of this paragraph shall be included in all sub-agreements to the agreement.

## ARTICLE VI: DISPUTES

### A. General

Parties shall communicate with one another in good faith and in a timely and cooperative manner when raising issues under this Article.

### B. Dispute Resolution Procedures

1. Any disagreement, claim or dispute between DARPA and the Team concerning questions of fact or law arising from or in connection with this Agreement, and, whether or not involving an alleged breach of this Agreement, may be raised only under this Article.

2. Whenever disputes, disagreements, or misunderstandings arise, the Parties shall attempt to resolve the issue(s) involved by discussion and mutual agreement as soon as practicable. In no event shall a dispute, disagreement or misunderstanding which arose more than three (3) months prior to the notification made under subparagraph B.3 of this article constitute the basis for relief under this article unless the Director of DARPA, in the interests of justice, waives this requirement.

3. Failing resolution by mutual agreement, the aggrieved Party shall document the dispute, disagreement, or misunderstanding by notifying the other Party (through the DARPA Agreements Officer or Team Administrator, as the case may be) in writing of the relevant facts, identify unresolved issues, and specify the clarification or remedy sought. Within five (5) working days after providing notice to the other Party, the aggrieved Party may, in writing, request a joint decision by the DARPA Senior Procurement Executive and senior executive (no lower than *(INSERT A LEVEL OF EXECUTIVE FAR ENOUGH REMOVED FROM THE PROGRAM TO MAINTAIN A GREATER LEVEL OF IMPARTIALITY)* level) appointed by the Team. The other Party shall submit a written position on the matter(s) in dispute within thirty (30) calendar days after being notified that a decision has been requested. The DARPA Senior Procurement Executive, and the senior executive shall conduct a review of the matter(s) in dispute and render a decision in writing within thirty (30) calendar days of receipt of such written position. Any such joint decision is final and binding.

4. In the absence of a joint decision, upon written request to the Director of DARPA, made within thirty (30) calendar days of the expiration of the time for a decision under subparagraph B.3 above, the dispute shall be further reviewed. The Director of DARPA may elect to conduct this review personally or through a designee or jointly with a senior executive (no lower than *(INSERT A LEVEL OF EXECUTIVE FAR ENOUGH REMOVED FROM THE PROGRAM TO MAINTAIN A GREATER LEVEL OF IMPARTIALITY)* level) appointed by the Team. Following the review, the Director of DARPA or designee will resolve the issue(s) and notify the Parties in writing. Such resolution is not subject to further administrative review and, to the extent permitted by law, shall be final and binding.

5. Subject only to this article and 41 U.S.C. § 321-322, if not satisfied with the results of completing the above process, either Party may within thirty (30) calendar days of receipt of the notice in subparagraph B.4 above pursue any right and remedy in a court of competent jurisdiction

## ARTICLE VII: PATENT RIGHTS

### A. Definitions

1. "Invention" means any invention or discovery which is or may be patentable or otherwise protectable under Title 35 of the United States Code.

2. “Made” when used in relation to any invention means the conception or first actual reduction to practice of such invention.

3. “Practical application” means to manufacture, in the case of a composition of product; to practice, in the case of a process or method, or to operate, in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is capable of being utilized and that its benefits are, to the extent permitted by law or Government regulations, available to the public on reasonable terms.

4. “Subject invention” means any invention of a Team Member conceived or first actually reduced to practice in the performance of work under this Agreement.

## B. Allocation of Principal Rights

Unless the Team shall have notified DARPA (in accordance with subparagraph C.2 below) that the Team does not intend to retain title, the Team shall retain the entire right, title, and interest throughout the world to each subject invention consistent with the provisions of the Articles of Collaboration, this Article, and 35 U.S.C. § 202. With respect to any subject invention in which the Team retains title, DARPA shall have a non-exclusive, nontransferable, irrevocable, paid-up license to practice or have practiced on behalf of the United States the subject invention throughout the world. Notwithstanding the above, the Team may elect as defined in its Articles of Collaboration to provide full or partial rights that it has retained to Team Members or other parties.

## C. Invention Disclosure, Election of Title, and Filing of Patent Application

1. The Team shall disclose each subject invention to DARPA within four (4) months after the inventor discloses it in writing to his company personnel responsible for patent matters. The disclosure to DARPA shall be in the form of a written report and shall identify the Agreement under which the invention was made and the identity of the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological, or electrical characteristics of the invention. The disclosure shall also identify any publication, sale, or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. The Team shall also submit to DARPA an annual listing of subject inventions.

2. If the Team determines that it does not intend to retain title to any such invention, the Team shall notify DARPA, in writing, within eight (8) months of disclosure to DARPA. However, in any case where publication, sale, or public use has initiated the one (1)-year statutory period wherein valid patent protection can still be obtained in the United States, the period for such notice may be shortened by DARPA to a date that is no more than sixty (60) calendar days prior to the end of the statutory period.

3. The Team shall file its initial patent application on a subject invention to which it elects to retain title within one (1) year after election of title or, if earlier, prior to the end of the statutory period wherein valid patent protection can be obtained in the United States after a publication, or sale, or public use. The Team may elect to file patent applications in additional countries (including the European Patent Office and the Patent Cooperation Treaty) within either ten (10) months of the corresponding initial patent application or six (6) months from the date permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications, where such filing has been prohibited by a Secrecy Order.

4. Requests for extension of the time for disclosure election, and filing under Article VII, paragraph C, may, at the discretion of DARPA, and after considering the position of the Team, be granted.

**D. Conditions When the Government May Obtain Title**

Upon DARPA's written request, the Team shall convey title to any subject invention to DARPA under any of the following conditions:

1. If the Team fails to disclose or elects not to retain title to the subject invention within the times specified in paragraph C of this Article; provided, that DARPA may only request title within sixty (60) calendar days after learning of the failure of the Team to disclose or elect within the specified times.

2. In those countries in which the Team fails to file patent applications within the times specified in paragraph C of this Article; provided, that if the Team has filed a patent application in a country after the times specified in paragraph C of this Article, but prior to its receipt of the written request by DARPA, the Team shall continue to retain title in that country; or

3. In any country in which the Team decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceedings on, a patent on a subject invention.

**E. Minimum Rights to the Team and Protection of the Team's Right to File**

1. The Team shall retain a non-exclusive, royalty-free license throughout the world in each subject invention to which the Government obtains title, except if the Team fails to disclose the invention within the times specified in paragraph C of this Article. The Team license extends to the domestic (including Canada) subsidiaries and affiliates, if any, of the Team Members within the corporate structure of which the Team Member is a party and includes the right to grant licenses of the same scope to the extent that the Team was legally obligated to do so at the time the Agreement was awarded. The license is transferable only with the approval of DARPA, except when transferred to the successor of that part of the business to which the invention pertains. DARPA approval for license transfer shall not be unreasonably withheld.

2. The Team domestic license may be revoked or modified by DARPA to the extent necessary to achieve expeditious practical application of the subject invention pursuant to an application for an exclusive license submitted consistent with appropriate provisions at 37 CFR Part 404. This license shall not be revoked in that field of use or the geographical areas in which the Team has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of DARPA to the extent the Team, its licensees, or the subsidiaries or affiliates have failed to achieve practical application in that foreign country.

3. Before revocation or modification of the license, DARPA shall furnish the Team a written notice of its intention to revoke or modify the license, and the Team shall be allowed thirty (30) calendar days (or such other time as may be authorized for good cause shown) after the notice to show cause why the license should not be revoked or modified.

**F. Action to Protect the Government's Interest**

1. The Team agrees to execute or to have executed and promptly deliver to DARPA all instruments necessary to (i) establish or confirm the rights the Government has throughout the world in those subject inventions to which the Team elects to retain title, and (ii) convey title to DARPA when requested under paragraph D of this Article and to enable the Government to obtain patent protection throughout the world in that subject invention.

2. The Team agrees to require, by written agreement, that employees of the Members of the Team working on the Team, other than clerical and non-technical employees, agree to disclose promptly in writing, to personnel identified as responsible for the administration of patent matters and in a format acceptable to the Team, each subject invention made under this Agreement in order that the Team can comply with the disclosure provisions of paragraph C of this Article. The Team shall instruct employees, through employee agreements or other suitable educational programs, on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars.

3. The Team shall notify DARPA of any decisions not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceedings on a patent, in any country, not less than thirty (30) calendar days before the expiration of the response period required by the relevant patent office.

4. The Team shall include, within the specification of any United States patent application and any patent issuing thereon covering a subject invention, the following statement: "This invention was made with Government support under Agreement No. MDA972-0*-3-00** awarded by DARPA. The Government has certain rights in the invention."

**G. Lower Tier Agreements**

The Team shall include this Article, suitably modified, to identify the Parties, in all subcontracts or lower tier agreements, regardless of tier, for experimental, development, or research work.

**H. Reporting on Utilization of Subject Inventions**

The Team agrees to submit, during the term of the Agreement, an annual report on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the Team or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Team subcontractor(s), and such other data and information as the agency may reasonably specify. The Team also agrees to provide additional reports as may be requested by DARPA in connection with any march-in proceedings undertaken by DARPA in accordance with paragraph J of this Article. Consistent with 35 U.S.C. § 202(c)(5), DARPA agrees it shall not disclose such information to persons outside the Government without permission of the Team.

**I. Preference for American Industry**

Notwithstanding any other provision of this clause, the Team agrees that it shall not grant to any person the exclusive right to use or sell any subject invention in the United States or Canada unless such person agrees that any product embodying the subject invention or produced through the use of the subject invention shall be manufactured substantially in the United States or Canada. However, in individual cases, the requirements for such an agreement may be waived by DARPA upon a showing by the Team

that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that, under the circumstances, domestic manufacture is not commercially feasible.

### J. March-in Rights

The Team agrees that, with respect to any subject invention in which it has retained title, DARPA has the right to require the Team, an assignee, or exclusive licensee of a subject invention to grant a non-exclusive license to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the Team, assignee, or exclusive licensee refuses such a request, DARPA has the right to grant such a license itself if DARPA determines that:

1. Such action is necessary because the Team or assignee has not taken effective steps, consistent with the intent of this Agreement, to achieve practical application of the subject invention;

2. Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the Team, assignee, or their licensees;

3. Such action is necessary to meet requirements for public use and such requirements are not reasonably satisfied by the Team, assignee, or licensees; or

4. Such action is necessary because the agreement required by paragraph (I) of this Article has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such Agreement.

## ARTICLE VIII: DATA RIGHTS

### A. Definitions

1. "Government Purpose Rights", as used in this article, means rights to use, duplicate, or disclose Data, in whole or in part and in any manner, for Government purposes only, and to have or permit others to do so for Government purposes only.

2. "Unlimited Rights", as used in this article, means rights to use, duplicate, release, or disclose, Data in whole or in part, in any manner and for any purposes whatsoever, and to have or permit others to do so.

3. "Data", as used in this article, means recorded information, regardless of form or method of recording, which includes but is not limited to, technical data, software, trade secrets, and mask works. The term does not include financial, administrative, cost, pricing or management information and does not include subject inventions included under Article VII.

### B. Allocation of Principal Rights

1. This Agreement shall be performed with mixed Government and Team funding. The Parties agree that in consideration for Government funding, the Team intends to reduce to practical application items, components and processes developed under this Agreement.

2. The Team agrees to retain and maintain in good condition until (INSERT NUMBER OF YEAR) ( ) years after completion or termination of this Agreement, all Data necessary to achieve

practical application. In the event of exercise of the Government's March-in Rights as set forth under Article VII or subparagraph B.3 of this article, the Team, acting through its Team Management Committee, agrees, upon written request from the Government, to deliver at no additional cost to the Government, all Data necessary to achieve practical application within sixty (60) calendar days from the date of the written request. The Government shall retain Unlimited Rights, as defined in paragraph A above, to this delivered Data.

3. The Team agrees that, with respect to Data necessary to achieve practical application, DARPA has the right to require the Team to deliver all such Data to DARPA in accordance with its reasonable directions if DARPA determines that:

(a) Such action is necessary because the Team or assignee has not taken effective steps, consistent with the intent of this Agreement, to achieve practical application of the technology developed during the performance of this Agreement;

(b) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the Team, assignee, or their licensees; or

(c) Such action is necessary to meet requirements for public use and such requirements are not reasonably satisfied by the Team, assignee, or licensees.

4. With respect to Data delivered pursuant to Attachment 2 **(and listed below)**, the Government shall receive Government Purpose Rights, as defined in paragraph A above. With respect to all Data delivered, in the event of the Government's exercise of its right under subparagraph B.2 of this article, the Government shall receive Unlimited Rights.

**C. Marking of Data**

Pursuant to paragraph B above, any Data delivered under this Agreement shall be marked with the following legend:

Use, duplication, or disclosure is subject to the restrictions as stated in Agreement MDA972-01-9-00** between the Government and the Team.

**D. Lower Tier Agreements**

The Team shall include this Article, suitably modified to identify the Parties, in all subcontracts or lower tier agreements, regardless of tier, for experimental, developmental, or research work.

## ARTICLE IX: FOREIGN ACCESS TO TECHNOLOGY

This Article shall remain in effect during the term of the Agreement and for (INSERT NUMBER OF YEARS) ( ) years thereafter.

**A. Definition**

1. "Foreign Firm or Institution" means a firm or institution organized or existing under the laws of a country other than the United States, its territories, or possessions. The term includes, for purposes of this Agreement, any agency or instrumentality of a foreign government; and firms, institutions or

business organizations which are owned or substantially controlled by foreign governments, firms, institutions, or individuals.

2. "Know-How" means all information including, but not limited to discoveries, formulas, materials, inventions, processes, ideas, approaches, concepts, techniques, methods, software, programs, documentation, procedures, firmware, hardware, technical data, specifications, devices, apparatus and machines.

3. "Technology" means discoveries, innovations, Know-How and inventions, whether patentable or not, including computer software, recognized under U.S. law as intellectual creations to which rights of ownership accrue, including, but not limited to, patents, trade secrets, maskworks, and copyrights developed under this Agreement.

**B. General**

The Parties agree that research findings and technology developments arising under this Agreement may constitute a significant enhancement to the national defense, and to the economic vitality of the United States. Accordingly, access to important technology developments under this Agreement by Foreign Firms or Institutions must be carefully controlled. The controls contemplated in this Article are in addition to, and are not intended to change or supersede, the provisions of the International Traffic in Arms Regulation (22 CFR pt. 121 et seq.), the DoD Industrial Security Regulation (DoD 5220.22-R) and the Department of Commerce Export Regulation (15 CFR pt. 770 et seq.)

**C. Restrictions on Sale or Transfer of Technology to Foreign Firms or Institutions**

1. In order to promote the national security interests of the United States and to effectuate the policies that underlie the regulations cited above, the procedures stated in subparagraphs C.2, C.3, and C.4 below shall apply to any transfer of Technology. For purposes of this paragraph, a transfer includes a sale of the company, and sales or licensing of Technology. Transfers do not include:

(a) sales of products or components, or

(b) licenses of software or documentation related to sales of products or components, or

(c) transfer to foreign subsidiaries of the Team Members for purposes related to this Agreement, or

(d) transfer which provides access to Technology to a Foreign Firm or Institution which is an approved source of supply or source for the conduct of research under this Agreement provided that such transfer shall be limited to that necessary to allow the firm or institution to perform its approved role under this Agreement.

2. The Team shall provide timely notice to DARPA of any proposed transfers from the Team of Technology developed under this Agreement to Foreign Firms or Institutions. If DARPA determines that the transfer may have adverse consequences to the national security interests of the United States, the Team, its vendors, and DARPA shall jointly endeavor to find alternatives to the proposed transfer which obviate or mitigate potential adverse consequences of the transfer but which provide substantially equivalent benefits to the Team.

3. In any event, the Team shall provide written notice to the DARPA Agreements Officer's Representative and Agreements Officer of any proposed transfer to a foreign firm or institution at least sixty (60) calendar days prior to the proposed date of transfer. Such notice shall cite this Article and shall state specifically what is to be transferred and the general terms of the transfer. Within thirty (30) calendar days of receipt of the Team's written notification, the DARPA Agreements Officer shall advise the Team whether it consents to the proposed transfer. In cases where DARPA does not concur or sixty (60) calendar days after receipt and DARPA provides no decision, the Team may utilize the procedures under Article VI, Disputes. No transfer shall take place until a decision is rendered.

4. In the event a transfer of Technology to Foreign Firms or Institutions which is NOT approved by DARPA takes place, the Team shall (a) refund to DARPA funds paid for the development of the Technology and (b) the Government shall have a non-exclusive, nontransferable, irrevocable, paid-up license to practice or have practiced on behalf of the United States the Technology throughout the world for Government and any and all other purposes, particularly to effectuate the intent of this Agreement. Upon request of the Government, the Team shall provide written confirmation of such licenses.

**D. Lower Tier Agreements**

The Team shall include this Article, suitably modified, to identify the Parties, in all subcontracts or lower tier agreements, regardless of tier, for experimental, developmental, or research work.

**ARTICLE X: CIVIL RIGHTS ACT**

This Agreement is subject to the compliance requirements of Title VI of the Civil Rights Act of 1964 as amended (42 U.S.C. 2000-d) relating to nondiscrimination in Federally assisted programs. Each Team Member company has signed an Assurance of Compliance with the nondiscriminatory provisions of the Act. The Parties recognize that since the Team has no employees, that compliance is the responsibility of each Team Member.

**ARTICLE XI: AGREEMENT DELIVERABLES**

*The Team shall list the agreement deliverables and the schedule date for delivery for the System Studies and Technology Development Phase.*

| DELIVERABLE | DATE FOR DELIVERY |
|---|---|
| Milestone 2 Report | 3 Months After Award (MAA) |
| QSP Systems Trade Study Report | 9 MAA |
| QSP Engineering Development Review (EDR) | 9 MAA |
| QSP Conceptual Aircraft Design | 12 MAA |
| QSP Technology Development Report | 12 MAA |

**ARTICLE XII: OPTION**

Task 3 QSP Technology Development - This is an unpriced option which, in the event of exercise, the Government will require a technical and price proposal.

Agreement No. MDA972-01-9-00XX
Attachment 1

# TASK DESCRIPTION DOCUMENT (TDD)

[To be submitted in offeror's format]

# INTEGRATED MASTER PLAN

**[To be submitted in offeror's format]**

## SCHEDULE OF PAYMENTS AND PAYABLE MILESTONES *[NOTIONAL]*

# LIST OF GOVERNMENT AND TEAM REPRESENTATIVES

**GOVERNMENT:**

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**TEAM :**

**(NAME)**
**(ORGANIZATION)**
(ADDRESS)
phone:
FAX:
Email:

**(NAME)**
**(ORGANIZATION)**
(ADDRESS)
phone:
FAX:
Email:

# Appendix A Section 845 "Other Transactions for Prototypes" Questionnaire

Offerors shall submit responses to each of the two questions, below, with their proposal. Please DO NOT provide "Boiler Plate" answers to these questions. Your response will form the foundation of a submission to DoD and Congress.

It is preferable that the response to each question consumes no more than one page. (A series of thought provoking questions are provided to assist you in formulating your responses.) Responses are to be provided in offeror format.

1. To what extent will the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement (if awarded to your team) contribute to a broadening of the technology and industrial base available for meeting Department of Defense needs? *Your discussion must focus on how the use of this "Other Transactions" agreement will contribute to a broadening of the technology and industrial base available for meeting DoD needs.*
2. To what extent will the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement (if awarded to your team) foster new relationships and practices that support the national security of the United States? *The discussion must focus on how the use of an "Other Transactions" agreement has fostered new relationships and practices that support the national security of the United States.*

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When formulating your responses to the two "Extent" questions, above, please consider the following:

The intention is for your answers to provide a brief explanation of the ways in which the use of a Section 845 "Other Transactions for Prototypes" agreement (if awarded to your team), rather than a standard procurement contract/cooperative agreement, will assist the Department of Defense in better meeting U.S. national security policy goals and objectives. Specifically:

1. Will the use of the Section 845 "Other Transactions for Prototypes" agreement allow you to involve any commercial firms in the project that would not otherwise have participated? If so:
    a. Which firms are they?
    b. Are there provisions of the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement, or features of the award process, that will enable their participation? If so, specifically what they are?
    c. What are the expected benefits of your team's participation (e.g., technology that is better, more readily available, or less expensive)? Please be specific about the benefits and explain why you expect to realize them.
    d. Why would other firms not participate if a standard instrument were used? For example: Do the firms in question normally not do business with the Government? Do they do business with the Government only through "Other Transactions" or contracts for commercial items? Or, do they limit their volume of Federal contracts

to avoid exceeding a threshold beyond which they would have to comply with cost accounting standards or some other Government requirement?

2. Will the use of the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement allow you to create new relationships among for-profit firms at the prime or subtier levels; allow you to create new relationships among business units of the same firm; or, allow you to create new relationships between firms and nonprofit performers that will help DARPA get better technology in the future? If so:
    a. Between which participants were the new relationships formed?
    b. Why does your team believe that these new relationships will help DARPA get better technology in the future?
    c. Were there provisions of the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement, or features of the award process, that will enable your participation? If so, specify what they are.

3. Will the use of the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement allow traditional Government contractors to use new business practices in the execution of this prototype project that will help DARPA obtain better technology, get new technology more quickly, or get it less expensively? If so:
    a. Who are those contractors and what are the new business practices?
    b. What specific benefits do you believe DARPA will obtain from the use of these new practices, and why do you believe that to be so?
    c. Were there provisions of the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement, or features of the award process, that will enable the use of these new practices? If so, specify what they are.

4. Are there any other benefits of the use of the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement that you perceive will help the Department of Defense better meet its objectives in carrying out this prototype project? If so, what are they; how do they help meet defense objectives; what features of the Quiet Supersonic Platform Section 845 "Other Transactions for Prototypes" agreement, or award process, will enable DARPA to realize? Please be specific.